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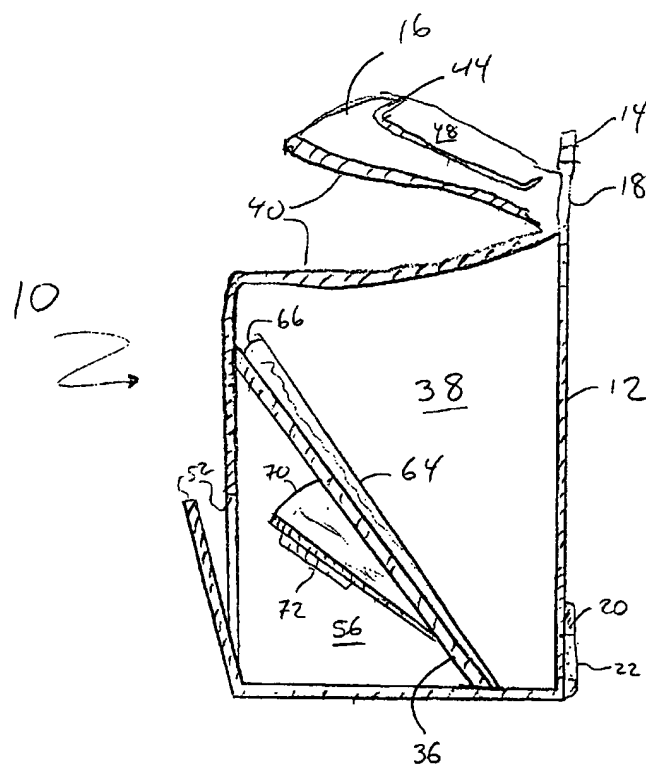
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(54) Title: BACKPACK



(57) Abrégé/Abstract:

A backpack (10) has at least one angled interior panel (36), to urge items placed inside the backpack into a location close to, and supported by, the user's hips without the need for adjusting the backpack's contents. An inverted "V"-shaped pad (20) on the exterior of the backpack, disposed near the bottom thereof, contacts the user's back, and rests automatically on the user's hips, thereby distributing the load of the backpack more evenly.

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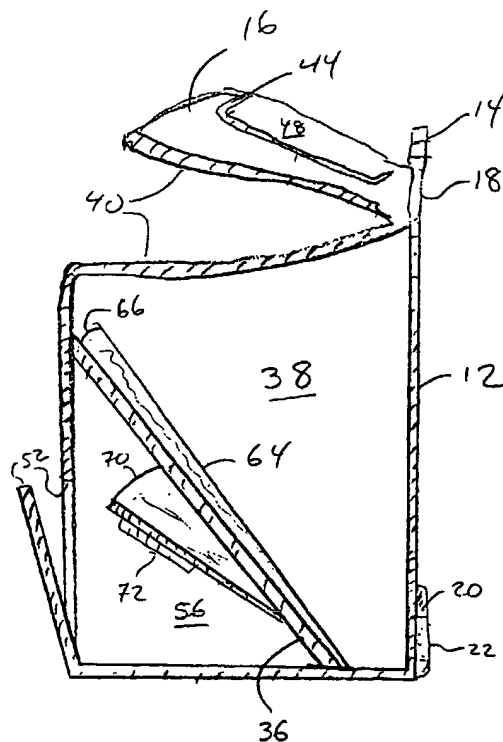
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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## Backpack

### BACKGROUND OF THE INVENTION

#### 5 1. Cross-reference to Related Application

Priority is claimed from U.S. Provisional Patent Application Serial No. 60/263,594, filed January 23, 2001.

#### 2. Field of the Invention

10 This invention relates to backpacks, and, more particularly, to a backpack which includes means for automatically distributing some of the load of the backpack on the hips of the user.

#### 3. Description of the Related Art

Backpacks are well known devices for carrying loads. Traditionally, the load of a backpack is carried high on the back, to put the center of gravity of the load over the hips. Placing the load on the hips reduces the strain on the user's back, by reducing the torque applied to the back, since the hips may carry a load more easily than the rest of the body. 20 Traditional backpacks, with only one set of straps to hold the backpack to the user's shoulders, are prone to having the bottom of the backpack move out of the correct position on the user's hips, because the load is carried so high on the back that it tends to wobble. To force the backpack into a steady, correct, position, many known backpacks utilize a second set of straps at the user's waist to hold the backpack in position so that the bottom of the backpack rests on the user's hips. This is useful, however, only when the user actually uses these additional straps. Many users do not, especially if 30 they take the backpack on and off repeatedly during the day.

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Furthermore, unless the user takes the time and care to pack the backpack to ensure that the contents of the backpack are distributed properly in the interior of the backpack, the natural bouncing of the backpack while the user  
5 is walking causes the backpack to move out of its proper position, where no set of waist straps are secured, and thereby adds needless strain to the user's back.

Many people use a backpack for relatively short periods, such as, for example, going to and from school or  
10 work. Where the user packs and unpacks the backpack many times during the day, there is a disincentive to take the time to pack and re-pack the backpack each time in a way to ensure correct weight placement. Instead, the user tends to throw the contents into the backpack, and withdraw contents from the  
15 backpack, without regard to proper placement or load balancing. This may cause heavy items, such as school books, to be stored in less than optimal positions within the backpack, also tending to urge the backpack out of its proper placement on the hips.

As a result, the weight of the load carried tends to be randomly distributed in the backpack, and may be improperly positioned away from the back of the user, leading to unnecessary downward torque on the back. Where the waist  
20 straps are not used, the problem is compounded, because the weight of the backpack is allowed to move away from the user's hips. All of these circumstances cause additional, and unnecessary, strain placed on the user.

Any system for distributing weight in a backpack, like any human-centered system, is only useful if it is used.  
30 A user who feels that the time taken to implement a system outweighs the short term benefit provided by the system may

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tend to skip it, no matter how useful or helpful, even though the long-term benefit may be significant. Thus, there is a need for a system for assisting users of backpacks to position the backpacks with a minimum of effort.

5           Furthermore, the normal differences in body size and shape among different users tend to make it difficult to accommodate the needs of individual users without the use of separately adjustable sizing elements, which may be used incorrectly, or ignored, as being too cumbersome to be  
10 worthwhile.

          There is thus a need for providing a backpack which may automatically shift the weight of the contents of the backpack into a preferred location, and also provide a more comfortable and ergonomically correct method of distributing  
15 the load of the backpack on the hips of the user without the need to strap on an additional set of straps, without regard to the individual shape or size of the user.

#### SUMMARY OF THE INVENTION

20           It is therefore an object of the invention to provide a backpack which tends to distribute the weight carried by the backpack into its correct position on the user's hips.

          It is a further object of the invention to provide a backpack in which a weight carried by the user is maintained in  
25 position on the user's hips without the need to utilize a set of waist straps.

          It is yet another object of the invention to provide a backpack in which the weight of the backpack may be carried in part on the user's hips without regard to the specific size and  
30 shape of the user's body.

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A backpack in accordance with the invention has at least one angled interior panel, to urge items placed inside the backpack into a location close to, and supported by, the user's hips without the need for adjusting the backpack's contents. The panel is angled to urge items placed thereon towards the front and bottom of the interior of the backpack, closer to the small of the back of the user when the backpack is worn properly. An inverted "V"-shaped pad on the exterior of the backpack, disposed near the bottom thereof, contacts the user's back, and rests automatically on the user's hips, thereby distributing the load of the backpack more comfortably. The "V" shape tends to balance the load on either side of the spine of the user, on each hip. The interior weight distribution assisted by the use of the angled panel causes the pad to rest on the user's hips without fastening additional securing straps.

Other objects and features of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are designed solely for purposes of illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims. It should be further understood that the drawings are not necessarily drawn to scale and that, unless otherwise indicated, they are merely intended to conceptually illustrate the structures and procedures described herein.

#### BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings in which like numerals represent like elements:

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Figure 1 is a perspective of the inventive backpack, shown partly in phantom;

Figure 2 is a rear perspective of the inventive backpack of Fig. 1; and

5           Figure 3 is a cross-section of the inventive backpack shown in Figs. 1 and 2, taken along the line III-III therein, with the straps omitted for ease of illustration.



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DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

Figure 1 shows a backpack 10 in accordance with the invention, showing the panel 12 worn closest to the back of the user when the backpack is worn. Backpack 10 includes a generally rectangular panel 12, preferably having some means of supporting its shape, such as, for example, an internal frame or a support sheet (not separately identified) of a semi-rigid material such as a flexible plastic sheet. Panel 12 may be generally flat, or may be shaped to conform to the contours of the back of a user, as a matter of design choice. For ease of illustration, it is depicted as generally flat in the drawings. Panel 12 generally defines the shape and size of backpack 10, but also includes a rigid flange 14 which projects above a top 16 of backpack 10. Flange 14 includes a handle 18, which is formed as an opening therein, to permit the holding of backpack 10 when not on the user's back. Alternatively, a handle may take the form of a strap attached to an upper surface or edge of the backpack.

A pad 20, which is shaped like an inverted "V", is positioned on the exterior of backpack 10, and is affixed to panel 12 on the side which is intended to be placed on the user's back. Pad 20 is the point of contact of backpack 10 on the back of the user, and so is preferably formed of any desired cushioning material, such as resilient foam, to provide a comfortable fit.

Pad 20 includes downwardly extending arms 22 which flare downwardly from a position on the left-right center line of panel 12 towards the bottom of backpack 10, forming the inverted "V" of pad 20 seen in Figure 1. This configuration ensures that pad 20 rests on the hips of the user when the backpack is worn, because no other point of contact between

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the user's body and backpack 10 exists at the bottom of backpack 10. Pad 20 will contact the user's hips at a position which depends upon the width of the user's hips at their uppermost side. A user whose hips are narrow will have  
5 the pad rest lower on his or her back than will a user (presumably larger) whose hips are wider apart. Regardless, however, pad 20 will contact the user's hips at two points, one on each of arms 22 corresponding to the distance between the user's hips at the point of contact.

10 Since the contact is at these two points, spaced apart equally on opposite sides of the user's spine, backpack 20 is centered on the user's spine, tending to assist backpack 10 in remaining in its desired position on the user's back.

Furthermore, the inverted "V" shape of pad 20 tends  
15 to distribute the weight of the contents of backpack 10 on either side of the spine of the user, by resting solely on each hip of the user, at the bottom of backpack 10.

A pair of shoulder straps 24 each have a padded portion 26 affixed to flange 14, and a thin securing portion  
20 28 affixed to a lower end of panel 12. Each padded portion 26 is attached to its respective securing portion 28 by conventional adjustable attachment means, such as, for example, by a buckle 30, which provides for relative adjustment of the overall length of strap 24 to accommodate  
25 the height of the user. Adjustment of the overall length of straps 24 permits the user to adjust the position of backpack 10 on his or her back, and thereby maintain "V" shaped pad 20 at the bottom of backpack 10 in contact with the hips as described above.

30 Preferably, the user may prevent slippage of straps 24 from the shoulders by use of a cross-strap 32, which

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includes a second adjustable fastener 34 to hold straps 24 in place. Fastener 34 may be adjusted to accommodate the width of the user's torso in conventional fashion.

Many different types of straps, fasteners, and height adjustment means are known in the art, and the selection of suitable types of these items is well within the skill of those of ordinary skill in the art depending upon matters of design choice.

A panel 36 (illustrated in phantom in Figure 1) is positioned to urge items placed within backpack 10 towards the user's hips. Panel 36 is angled from the top back of backpack 10 towards the front bottom of backpack 10, thereby urging items placed on panel 36 to move closer to the user's hips, without the user having to affirmatively shift the contents of backpack 10 each time items are placed into or removed from backpack 10. Panel 36 may be rigid, such as, for example having a semi-hard plastic support therein, or flexible, such as, for example, by being formed purely of a sturdy fabric. In the preferred embodiment, shown best in Figure 3, two panels may be used, as will be described, for compartmentalizing the items placed within backpack 10. This is a matter of design choice. In any event, the positioning of panel 36 within backpack 10 forms a chamfered compartment 38 (best seen in Figure 3) for holding items within backpack 10.

In an alternate design, chamfered compartment 38 may be the only compartment in the backpack, in which case panel 36 would comprise the exterior of the backpack.

In either embodiment, the fact that items to be carried are placed on angled panel 36 causes a portion of the downward force exerted on panel 36 by gravity to translate to

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a horizontal force vector in the direction of the user's back. This serves to reduce the apparent load of the backpack by displacing a portion of the total load to the user's hips rather than having the entire load carried on the user's shoulders.

Turning to Figure 2, a first zippered opening 40 attaches top 16 of backpack 10 to the remainder thereof. Zippered opening 40 may include one or more conventional zipper pulls 42 for opening and closing compartment 38. Top 10 16 may optionally include a second zippered opening 44, which includes at least one zipper pull 46 for accessing an optional top compartment 48, in which, for example, a personal stereo device could be placed. For such uses, an optional flapped opening 50 could be included in top 16, for permitting a 15 headphone cord to be threaded therethrough.

A third zippered opening 52, having zipper pulls 54, may be provided for accessing a lower compartment 56 (see Figure 3) in the lower part of backpack 10. In a preferred embodiment, a slashed pocket 58 may be placed in a rear of 20 backpack 10, as well as a small rear pocket 60, accessible by a fourth zippered opening 62, having at least one zipper pull 64.

The interior of backpack 10 is illustrated in Figure 3. As may be seen, chamfered compartment 38 is defined as the 25 area between panel 36 and panel 12. It is smaller at the bottom than at the top, so that any items placed into the top through zippered opening 40 will be urged into a position at the bottom and front of compartment 38, i.e. closer to the hips of the user, which will be supporting pad 20. In this 30 fashion, the weight of the backpack will be urged into the position providing the most comfort and support. The angling

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of compartment 38 therefore obviates the need for using a separate securing means for holding backpack 10 in place, and increases the usability thereof without the need for shuffling the contents of backpack 10 or securing the lower end of backpack 10 with a separate strap-and-buckle arrangement.

Figure 3 also illustrates optional elements for providing further utility of backpack 10, such as a first flexible divider 64 attached to panel 36 by a web 66, to permit the division of compartment 38 into two separate storage areas, if desired. Additional divider 68, attached to the bottom of panel 36 by a second web 70, may divide lower compartment 56 into separate areas. Optional storage elements 72, such as pen pockets, computer disk pockets or other small elements may be mounted to the underside of additional divider 68.

Thus, while there have been shown and described and pointed out fundamental novel features of the invention as applied to a preferred embodiment thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices illustrated, and in their operation, may be made by those skilled in the art without departing from the spirit of the invention. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Moreover, it should be recognized that structures and/or elements and/or method steps shown and/or described in connection with any disclosed form or embodiment of the invention may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice. It

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is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.

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CLAIMS

What is claimed is:

1. A backpack, for carrying items on the back of a user,  
5 said backpack comprising:  
means for holding said items;  
means for securing said means for holding to said user;  
and  
a "V" shaped pad for distributing the weight of said  
10 backpack, including the weight of said items, on the hips of  
said user, said pad being mounted on said means for holding  
and having arms which are configured to rest on said hips of  
said user;  
whereby the contact of said arms of said pad with said  
15 hips of said user serves to dispose said weight of said  
backpack, including said weight of said items, on said means  
for holding, substantially equally on either side of the spine  
of said user.
- 20 2. The backpack of claim 1, wherein said means for holding  
includes a chamfered compartment having a bottom end  
positioned in proximity to the back of said user, and wherein  
said bottom end is smaller than a top of said means for  
holding.
- 25 3. The backpack of claim 1, further comprising an angled  
member disposed within said means for holding, for urging the  
weight of items placed on said angled member towards the front  
bottom of said means for holding.

30

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4. The backpack of claim 3, wherein said means for holding includes a panel for positioning said means for holding relative to said back of said user; and

5 said angled member has a top end and a bottom end, said bottom end being disposed within said means for holding closer to said hips of said user than is said top end, and said top end is positioned closer to the top of said means for holding and further from said back of said user than is said bottom end.

10

5. The backpack of claim 4, wherein said angled member includes a rigid panel.

15 6. The backpack of claim 5 wherein said angled member is substantially flexible.

7. A backpack, for carrying items on the back of a user, said backpack comprising:

20 means for holding said items;  
means for securing said means for holding to said user;  
and

an angled member disposed within said means for holding, for urging the weight of items placed on said angled member towards the front bottom of said means for holding.

25

8. The backpack of claim 7, wherein said angled member forms part of the exterior of said backpack, so that a bottom of said means for holding is smaller than a top of said means for holding, and said bottom of said means for holding is disposed  
30 in proximity to the back of said user.



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9. The backpack of claim 7, wherein said angled member includes a rigid panel.

10. The backpack of claim 7 wherein said angled member is  
5 substantially flexible.

11. The backpack of claim 7, wherein said means for holding includes a panel for positioning said means for holding relative to said back of said user; and

10 said angled member has a top end and a bottom end, said bottom end being disposed within said means for holding closer to said hips of said user than is said top end, and said top end is positioned closer to the top of said means for holding and further from said back of said user than is said bottom  
15 end.

12. A backpack, for carrying items on the back of a user, said backpack comprising:

a compartment for holding said items, said compartment  
20 including a panel disposed to contact at least a portion of said back of said user and the hips of said user and forming a side of said container;

at least one strap secured relative to said panel, for securing said compartment to said user;

25 a pad mounted on said panel, and disposed to contact said hips of said user, said pad being configured to urge said compartment into a position in which said compartment is substantially equally disposed on each side of the spine of said user; and

30 an angled member disposed within said compartment, said angled member having a top end and a bottom end, said bottom

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end being disposed closer to said hips of said user than is said top end, and said top end being disposed farther from said panel than is said bottom end;

whereby the weight of said items is urged onto said hips  
5 of said user.

13. The backpack of claim 12, further comprising means for adjusting the length of said at least one strap to accommodate the height of said user, whereby said pad will be maintained  
10 in a desired position on said hips of said user regardless of said height of said user, within a predetermined range of heights.

14. The backpack of claim 12, wherein said pad is "V" shaped.

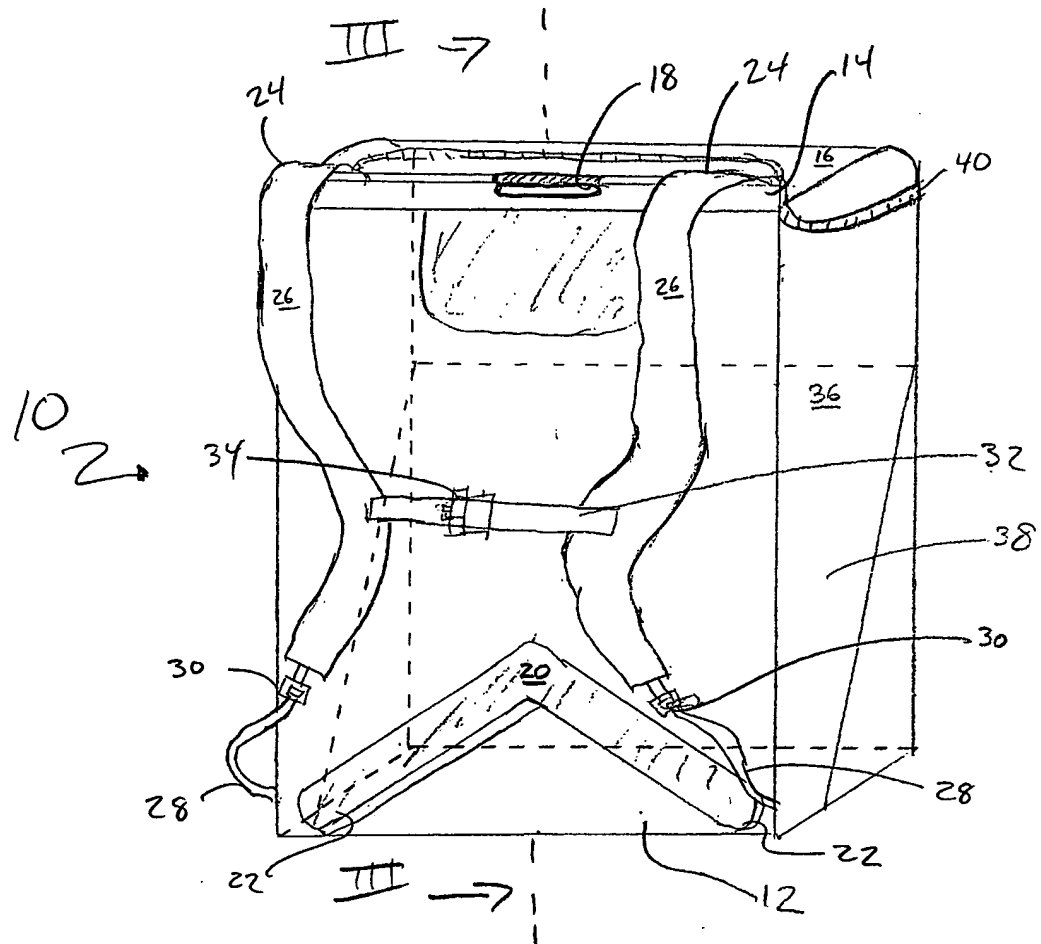


Fig. 1

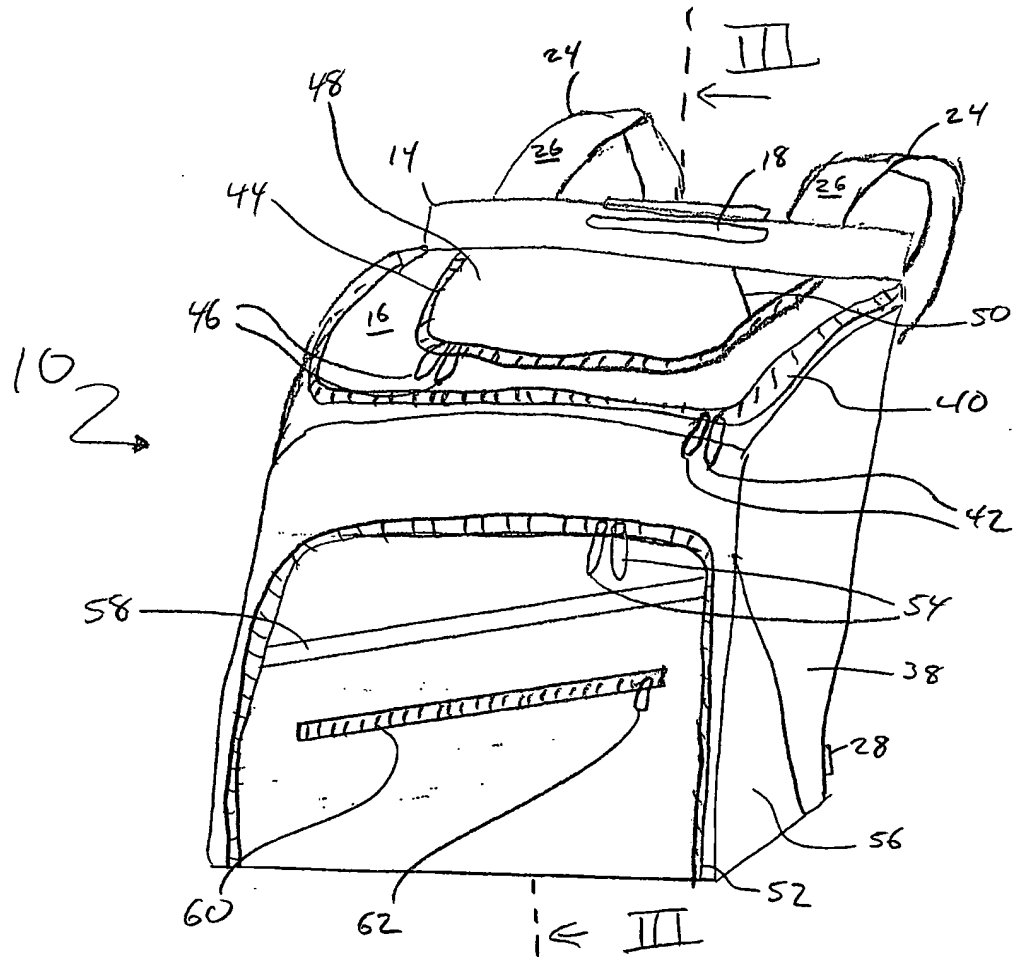


Fig. 2

